IL-55-08

STATE OF ILLINOIS
AIR POLLUTION CONTROL BOARD
616 STATE OFFICE BUILDING
SPRINGFIELD, ILLINOIS 62706

FOR INFORMATION TELEPHONE 525-7327
(AREA 217)

TECHNICAL SECRETARY
CLARENCE W. KLASSEN
Chief Sanitary Engineer
Department of Public Health
Telephone 525-6580 (Area 217)

INSTALLATION PERMIT APPLICATION

FOR SOURCE OPERATIONS AND GAS CLEANING DEVICES

Page 1

FOR OFFICE USE ONLY
I. D. No. [ ][ ][ ][ ][ ]
Permit No. [ ][ ][ ][ ][ ]
Date Examined [ ][ ][ ][ ][ ] By [ ]

1. Name of Owner: Swift Agricultural Chemicals Corporation
Address of Owner: 2 North Riverside Plaza Chicago, Illinois 60606

2. Name and title of person preparing application:
W. H. Biederman, Director of Engineering
Signature: W. H. Biederman

3. Name of Installation: Swift Agricultural Chemicals Corporation Fertilizer Plant
Address of Installation: (street, city, county, zip code)
2501 N. Kings Highway, Fairmont City, Ill.

[X] Inside incorporated limits — City named Fairmont City [ ] Outside limits in Township

0 3 6 6 0 9 1 7 3

4. SOURCE OPERATION SCHEDULE (COMPLETE MODIFIED FORM B FOR EACH)

NO. OF UNITS	SOURCE OPERATION	NO. OF UNITS	SOURCE OPERATION	NO. OF UNITS	SOURCE OPERATION	NO. OF UNITS	SOURCE OPERATION
(a)	Spray Booth	(k)	Sandblast	(u)	Dryer	(ae) 1	Ammoniator-Granulator
(b)	Silk Screen Process	(l)	Rotoblast	(v)	Heat Treating	(af)	
(c)	Flowcoater	(m)	Shot Blast	(w)	Other Oven	(ag)	
(d)	Paint Dip	(n)	Mixers	(x)	Crucible	(ah)	
(e)	Other Dip	(o)	Classification	(y)	Cupola	(ai)	
(f)	Conveyors	(p)	Grinding	(z)	Electric Arc	(aj)	
(g)	Tanks	(q)	Disintegration	(aa)	Induction	(ak)	
(h)	Printing	(r)	Baking Oven	(ab)	Reverberatory	(al)	
(i)	Storage Rooms	(s)	Curing Oven	(ac)	Rotary	(am)	
(j)	Bulk Loading or Unloading	(t)	Kiln	(ad)	Shake Out Areas	(an)	OTHER

5. GAS CLEANING DEVICES SCHEDULE: (COMPLETE PAGE 3 FOR THESE DEVICES)

NO. OF UNITS	CONTROL DEVICE	NO. OF UNITS	CONTROL DEVICE	NO. OF UNITS	CONTROL DEVICE	NO. OF UNITS	CONTROL DEVICE
(a)	Settling Chamber (09)	(e)	Spray Chamber (05)	(i)	Absorber (01)	(m)	Fabric Filter (13)
(b)	Cyclone (10)	(f) 1	Scrubber (06)	(j)	Adsorber (02)	(n)	Electrostatic Precipator (14)
(c)	Multiple Cyclone (11)	(g)	Packed Tower (07)	(k)	Catalytic burner (03)	(o)	Masking (15)
(d)	Rotoclone (12)	(h)	Venturi Scrubber (08)	(l)	Afterburner (04)	(p)	Other — Specify (16)

6. EQUIPMENT COST

Total Installed Cost Equipment	Cost of Gas Cleaning Equipment	% of Total Equipment Cost
$280,000	$146,000	52

Tax Relief Applied For:	Date Applied For:	No. of tax Form:
[ ] Yes [X] No		

Form APCB 10 — July 1968

SOURCE OPERATIONS DIAGRAM

INSTRUCTIONS:

(a) Flow diagram may be schematic or to scale. All equipment should be shown.

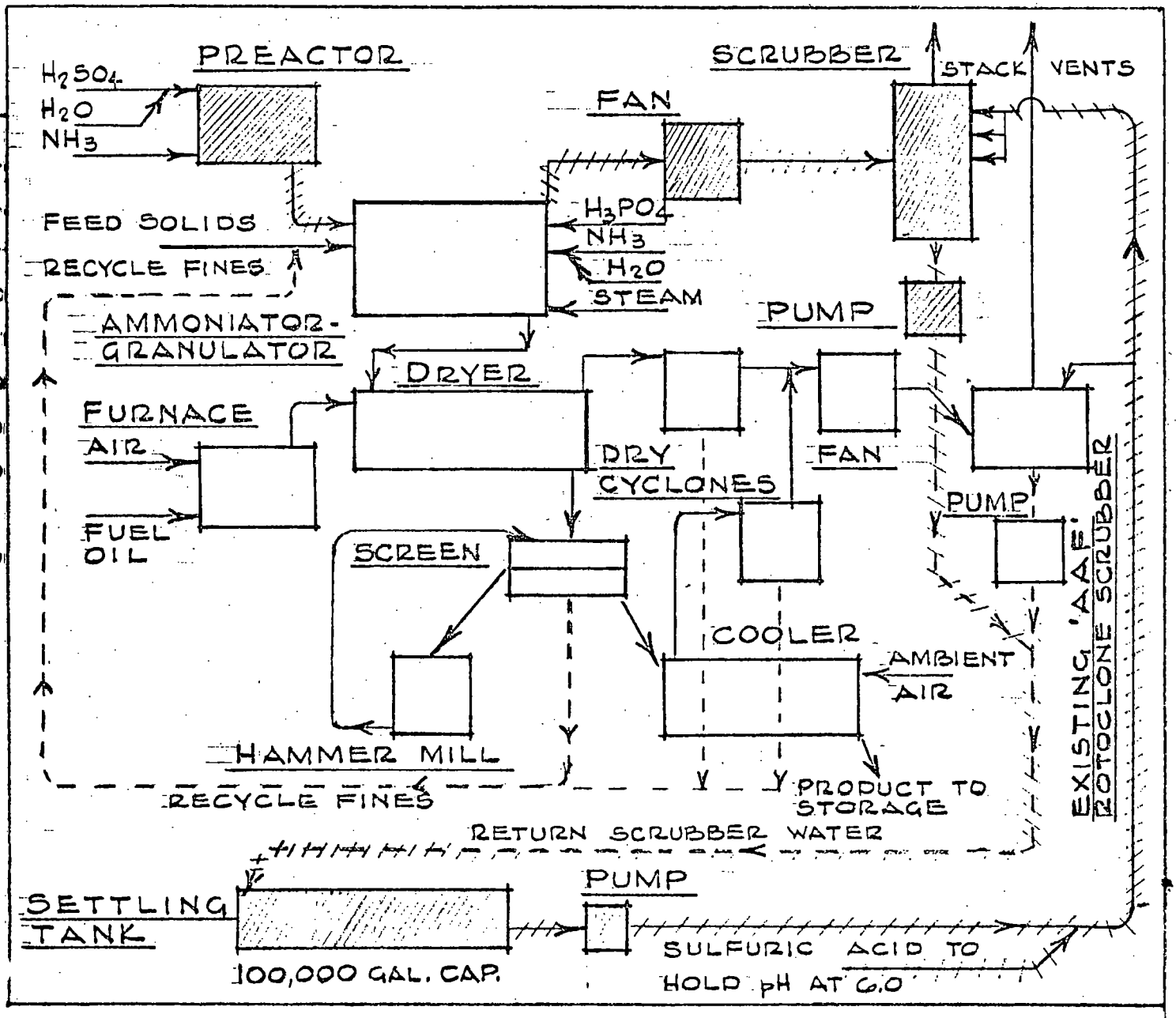
(b) Show complete flow diagram of source operation from raw materials to finished product.

(c) If more than one source operation is being constructed to make finished product, then show each separately and indicate where they merge.

(d) Show number of pieces of equipment doing the same operation.

(e) Indicate all points in process where all or other gases leave the process.

(f) Use key on Schedules 4 and 5 or Form B to indicate Equipment, Material, or Stack.



CROSS-HATCHED SECTIONS INDICATE ADDITIONS TO EXISTING FACILITIES

STATE OF ILLINOIS
AIR POLLUTION CONTROL BOARD
616 STATE OFFICE BUILDING
SPRINGFIELD, ILLINOIS 62706

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INSTALLATION PERMIT APPLICATION

FOR SOURCE OPERATIONS AND GAS CLEANING DEVICES

0366 00175

1	a. Complete the sections indicated: [x] 1 [x] 2 [ ] 3 [ ] 4 [x] 5 [x] 6 [x] 7 [ ] 8 [x] 9 [x] 10 [ ] 11		b. Installation Address: 2501 N. Kingshighway Fairmont City, Illinois	
	c. Owner Name: Swift Agricultural Chemicals Corporation.		d. Owner Address: 2 North Riverside Plaza Chicago, Illinois 60606	
	e. Prepared by: (Signature) W. H. Biederman		f. Prepared by: (Name and title) W. H. Biederman, Director of Engineering	
2	a. EQUIPMENT DATA	b. Type of Equipment: Wet cyclone scrubber	c. Make and Model: Ceilcote Co., Inc.	d. Dimensions (LxWxH): 5' dia. x 17' high
	e. Number of units, capacity: 1 - 9000 cfm	f. Ceilcote Drawing # D-70319	g. Auxiliary Equipment: 24 Veejet nozzles	h. Connected to: Ammoniator-Granulator
3	a. SETTLING CHAMBER	b. Retention time (sec.): 8 hours	c. Dimensions (LxWxH): 50' dia. x 8'-0"	d. Settling Velocity (FPS)
	e. Number of units on construction: 1	f.	g. Length of settling path	h. Connected To:
4	a. BURNER DATA	b. Type of Burner, Fuel	c. Make and Model	d. Rating
	e. Number of units, ignition	f.	g. CFM Exhausted (Temperature)	h. Connected To:
5	a. STACKS, VENTS AND EXHAUST OPENING	b. Type of Vent: Circular FGRP duct	c. Dimensions (LxWxH): 24" dia. x 20' high	d. Dampers: None
	e. Number of vents, construction: 1	f.	g. CFM Exhausted (Temperature) [ ] o/s [ ] i/s	h. Connected To: Wet scrubber
6	a. LIQUID FLOW	b. Flow (Spray, Bubbler, etc.): 88 GPM thru	c. Contact Area	d. Contact Time (sec.)
	e. Composition of Solution: H_2O at pH=6.0+ Am. Sul.	f. 24 Veejet nozzles	g. Flow Rate (GPH): 6000	h. Make Up (GPH): to compensate for evaporation
7	a. FAN DATA	b. Type of Fan (Designate Blade): Plastic Blower Co.	c. Make and Model: BH Series, Size 48	d. Motor Data: 50 HP, 440V, 3 phase
	e. Number of fans, construction: 1 plastic	f. Their Drawing # B-BH-2	g. CFM Exhausted (Temp. @ S.P.) [ ] o/s [ ] i/s	h. Connected To: Stack
8	a. CYCLONE DATA	b. Type of Cyclone [ ] multiclone [ ] common [ ] split duct	c. Make and Model	d. Inlet Area: Sq. Ft.
	e. Number of units, construction: None	f. Body Diameter: inch; Outlet Diameter: inch	g. Body Height: Inch; High Efficiency [ ] Yes [ ] No	h. Connected To:
9	a. WASTE DATA	b. Description of waste: Scrubber water	c. Amount Collected: Pounds/Day (specify)	d. Particle Size (Average): Microns
	e. Types of Pollutants [x] Odor [x] Particulate [ ] Aerosol [x] Gas	f. in closed recycle	g. Collection [ ] In Bins [ ]	h. Disposition of Collected Wastes [ ] Scavenger [ ] (specify)
10	a.	b. system at pH 6.0	c. Settling chamber	d. Recycle to process
	e.	f. and sat. with	g.	h.
11	a.	b. $(NH_4)_2SO_4$ plus	c.	d.
	e.	f. phosphate and potash	g.	h.
	i.	j. solids	k.	l.

ILLINOIS AIR POLLUTION
CONTROL BOARD

cc 80 FORM B – SOURCE OPERATION DATA

SOURCE OPERATION NUMBER 06 — cc 79 = CARD IDENTIFICATION – PUNCH: 9 — I.D. NO cc 1 – 6

A. DESCRIBE SOURCE OPERATION AND TYPE OF PROCESS EQUIPMENT.

Mixed fertilizer ammoniator-granulator vapors of, steam, and ammonia in air withdrawn by exhaust fan to a wet scrubber. (See attached.)

Nominal 12-12-12 as a typical large tonnage grade.

Card Cols. 7 8 9

OFFICE USE ONLY — CARD COLS. 10 11 12 13 — BEC NUMBER — 14 15 16 17 — BEC FACTOR

B. RAW MATERIALS USED IN SOURCE OPERATION FOR NORMAL THROUGHPUT CAPACITY. NORMAL OPERATION IS ___ % OF MAXIMUM CAPACITY.

MATERIAL	STARTING WEIGHT	MATERIAL	STARTING WEIGHT
1. Ammonium Sulfate	16,760 lbs./hr.	5. Anhydrous Ammonia	1920 lbs./hr.
2. Triple Super	920 lbs./hr.	6. Sulfuric Acid	2160 lbs./hr.
3. Potassium Chloride	8,000 lbs./hr.	7. Phosphoric Acid	6800 lbs/ hr.
4. Neutro-Phos	2,000 lbs./hr.	8. Filler	2700 lbs./hr.

C. EMISSION: Check types of discharge that can possibly be emitted from process or equipment directly to atmosphere through stacks or ducts.

cc 18 - 1 [X] Solid, particulate matter
cc 19 - 2 [X] Steam
cc 20 - 3 [X] Gases, vapors or fumes
cc 21 - 4 [X] Odors of any type
cc 22 - 5 [X] Mists or Aerosols
cc 23 - 6 [ ] None

SOURCE OPERATION DISCHARGES – cc 24
1 [X] From Stack 2 [ ] At Ground Level 3 [ ] From Vents or other Opening

cc 25 26 27 28: 3 8 (FT.) STACK HEIGHT ABOVE GRADE

D. PROCESS WEIGHT RATE (lbs./hr.) — cc 29 30 31 32 33 34 35: 7 2 2 0 5

E. OPERATION TIME hrs/day — cc 36 37 38: 1 6

L. OPERATION IS
[X] Continuous
[ ] Batch — Cycle per batch (hrs.). . . . . — CD. COLS. 48 49 50

COLLECTION EQUIPMENT

F. INLET GAS RATE — CARD COLS 51 52 53 54 55 56 57: 3 4 0 0 0 (SCFM) 34,000 total

G. INLET LOADING — Dryer & cooler only in 25,000 scfm GRAINS/SCF . . . . . — 39 40 41 42: 1 4

H. From dry cyclones gr/SCF — 58 59 60 61: 1 4
lbs/1000 lbs GAS From granulator — 2 1

I. PRIMARY COLLECTOR: dry cyclones (See Code Below) — 43 44: 1 0

J. SECONDARY COLLECTOR: wet scrubbers (See Code Below) — 62 63: 0 6

K. (%) Card Cols. 64 65 66: 9 2 — 45 46 47: 9 0

M. MEASURED – ESTIMATED – EMISSIONS TO ATMOSPHERE (lbs/hr) . Overall both stacks — 67 68 69 70 71: 3 7

N. ALLOWABLE EMISSIONS TO ATMOSPHERE (lbs/hr.) . . . . . — 72 73 74 75 76: 4 1

INSTRUCTIONS: (NOTE – Dotted lines indicate position of decimal point. Use additional sheets for miscellaneous comments.)

Item A. Describe your source operation and type of process equipment.
B. List all starting raw materials charged, including solid fuels. Specify lbs/hr. For batch operations specify lbs.
C. Check appropriate boxes and enter discharge information.
D. Indicate the total weight rate of all materials introduced into the source operation. Solid fuels charged will be considered as part of the process weight but liquid and gaseous fuels and combustion air will not. Include recycled material. -- 75% of production.
E. Enter normal operational hours per day for this source operation.
F. Enter rate of gas inlet to collection equipment in standard cubic feet per minute.
G&H. Enter particulate concentration of gas inlet to collection equipment in either column G or H.
I&J. List collection equipment serving the process, code as follows:

01–Absorber 02–Adsorber 03–Catalytic burner 04–Afterburner 05–Spray Chamber 06–Scrubber 07–Packed Tower 08–Venturi Scrubber 09–Settling Chamber 10–Cyclone 11–Multiclone 12–Rotoclone 13–Baghouse 14–Precipitator 15–Masking 16–Other

K. Enter estimate of collector efficiency (%).
L. Check type of operation. For batch operation, enter hours per batch cycle.
M. Enter estimate of particulates emitted to the atmosphere from this operation in lbs/hr. Circle Measured or Estimated.
N. Enter allowable emission from Table I, Chapter III of the Regulations.

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September 22, 1970

SWIFT AGRICULTURAL CHEMICALS CORP.
FERTILIZER PLANT - FAIRMONT CITY, ILLINOIS

Description of Source Operation and Type of Process Equipment

The manufacture of granular chemical fertilizers comprises a mixing together of various milled dry ingredients into a base blend which are then subsequently combined with liquids to form an agglomerating mixture within a rotary drum. The latter is called an ammoniator-granulator which in this plant will operate on a continuous basis. At this stage of manufacture, the various ingredients react chemically to form ammonium phosphates and ammonium sulfate by the combination of liquid anhydrous ammonia with the superphosphates in the dry ingredient blend and the added liquid phosphoric acid and/or sulfuric acid. Considerable heat is derived from the foregoing exothermic reactions to increase the temperature of the mixture within the ammoniator-granulator so that a substantial portion of the moisture present in the solids, the acid or that added as such will evolve as steam. Under these conditions the rolling mass within the rotary drum attains a plasticity which induces the finely divided solids to agglomerate into a range of larger sized particles. Hence, the designation for this process device as the ammoniator-granulator. The excess steam from the ammoniator-granulator is drawn off through a duct and fan which induces sufficient air flow to thoroughly ventilate the process at this stage. The combination of air and steam vapors will also carry some ammonia vapor as the adsorption and chemical reaction within the ammoniator-granulator is not 100% effective. The minimum efficiency should never be lower than 95% and usually runs substantially better, i.e. 97-98%.

It is estimated that the proposed wet scrubber which will wash this combination air-steam-ammonia with a water solution of ammonium sulfate at a controlled pH of 6.0 will have an absorption efficiency of greater than 92%.

As a further improvement in the ammoniator-granulator operation, the system will include a pre-reactor to provide a preliminary neutralization of the sulfuric acid so that it will be unreactive with the potassium chloride (KCl) dry ingredient portion of the base blends. Prior operation of ammoniator-granulators has been carried out adding strong sulfuric acid directly to the base blend and resultant interaction of the H_2SO_4 and KCl to evolve some HCl vapors which in turn combined with NH_3 vapor to form an aerosal of ammonium chloride (NH_4Cl). The granulation system at Fairmont City will not be plagued with generation of a haze due to NH_4Cl formation, a difficult material to scrub out.

It should be emphasized that phosphoric acid is not reactive with KCl at the temperatures involved in the process, i.e. 180-250°F. It can therefore be added directly to the A-G drum.

Following the ammoniation-granulation step, the product is dried in a rotary tube dryer heated with a co-current flow of hot air direct from a fuel oil fired furnace. The air withdrawn from the dryer is pulled through an existing duct and dry cyclone, into an existing fan and then through an existing wet scrubber (AAF Rotoclone).

Dry granular product leaving the dryer is subsequently screened to remove over-size and fines for recycle and on-size product is showered in a rotary tube cooler in a counter current flow of ambient air. The latter is withdrawn through an existing duct and dry cyclone after which it combines with the dryer cyclone discharge to enter the common fan and forced through the same wet scrubber which cleans the dryer air.

In order to obtain effective air cleaning in both the Ceilcote Co., Inc. wet scrubber for the ammoniator-granulator and the AAF Rotoclone wet scrubber adequate amounts of clear supernatant overflow will be withdrawn from a 100,000 gallon capacity settling tank where in excess of 8 hours hold-up will be provided. This recycled water will have a controlled quantity of sulfuric acid added so the pH is held at 6.0. Material accumulating in the settling tank will be withdrawn at regular intervals to be used in formulation of granular chemical fertilizers. No overflow will occur from the settling tank to the plant drainage system or outfall sewers. Sufficient make-up water will be added to compensate for the evaporation occurring in the scrubbers.

REPORT OF PHASE II

of the

STACK SAMPLING PROGRAM

for

SWIFT AGRICULTURAL CHEMICALS CORPORATION

Fairmont City, Illinois

September, 1971

RETA-1114

RYCKMAN · EDGERLEY · TOMLINSON and ASSOCIATES

500 CORONET BUILDING • 225 SOUTH MERAMEC AVENUE • SAINT LOUIS, MISSOURI 63105
TELEPHONE: (314) 862-3424

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

INTRODUCTION

On October 5, 1971, Ryckman, Edgerley, Tomlinson and Associates, Incorporated (RETA) conducted an extensive stack sampling program on the exhaust gases of the fertilizer dryer stack of the fertilizer manufacturing plant of Swift Agricultural Chemicals Corporation, Fairmont City, Illinois. The dryer stack discharges exhaust gases from the fertilizer dryer and cooler. These exhaust gases pass through cyclones and then an American Air Filter Roto-Clone scrubber equipped with Heil Mist Eliminators before being discharged to the atmosphere.

The fertilizer plant production rate during the sampling program was reported by Swift personnel to be 20 tons per hour of 12-12-12 with a product recycle of 80%, thus yielding a total process weight rate of 36 tons per hour.

Exhaust gas parameters of concern included velocity, volume and and temperature of the exhaust gases and particulate discharge rates. The purpose of the stack sampling program was to provide data to determine if the existing particulate (dust and fume) emissions rates were within the allowable rates of emissions as set forth by the State of Illinois Air

Pollution Control Board. The tests were witnessed by Mr. Anton Telford, Acting Manager of Region IV, and Mr. Clarence Beck, Environmental Protection Engineer of the Division of Air Pollution Control of the Illinois Environmental Protection Agency.

SAMPLING PROCEDURES AND ANALYTICAL METHODS

All stack emissions tests, laboratory analyses and data calculations were conducted in accordance with the "State of Illinois Control Board Rules and Regulations Governing the Control of Air Pollution," as amended August 19, 1969. Article 3-3.113 of the "Rules and Regulations" states, "Measurement of emissions of particulate matter from a particular source will be made according to the procedures recommended in the ASME Power Test Code 27-1957...". When deemed necessary by RETA personnel, additional work not covered by the above-mentioned sources was performed in accordance with normal RETA policies to insure that Swift Agricultural Chemicals Corporation received the required information. The sampling and analytical techniques used in this program are described below.

Velocity, Temperature and Moisture Determinations

Velocity determinations were conducted using a Stauscheibe (Type S) pitot tube connected to a differential manometer as shown in Figure 1. Velocity traverse point locations were determined by

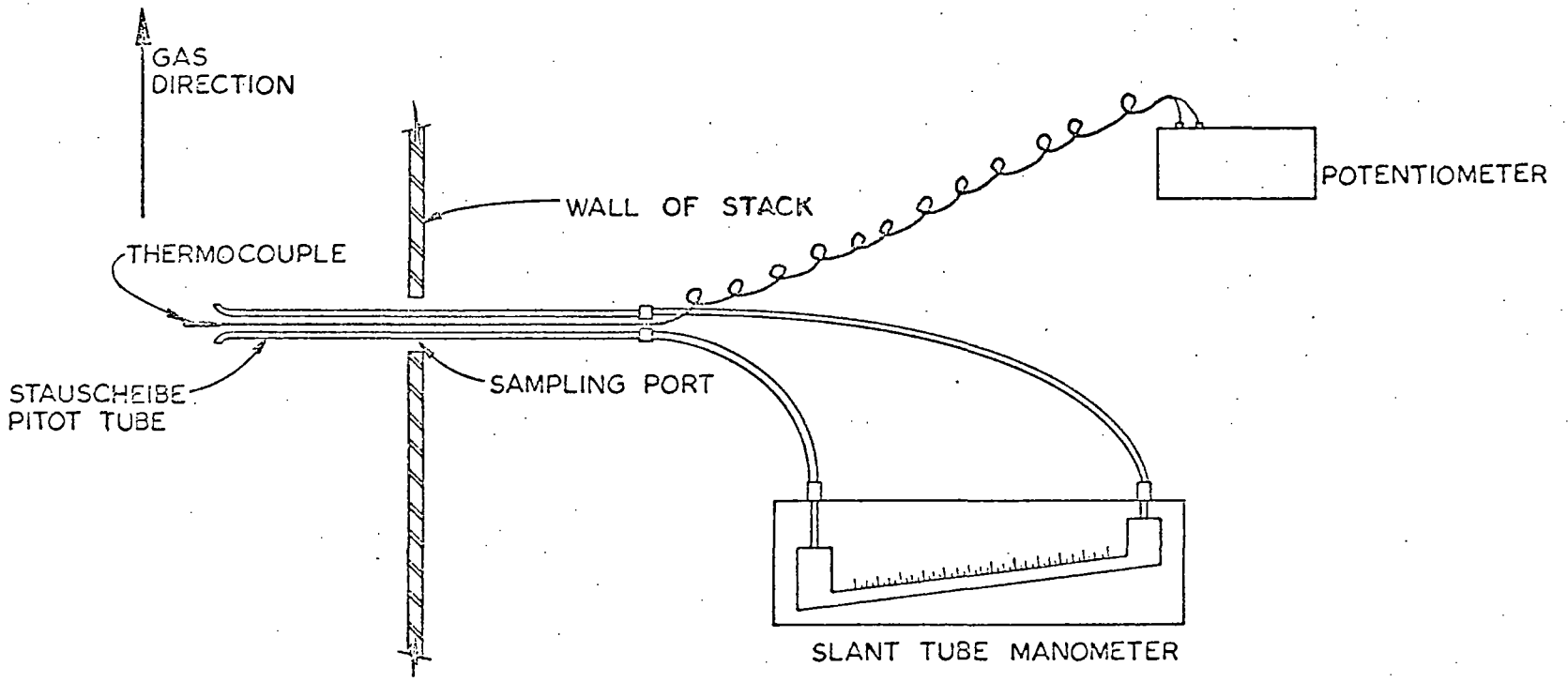


FIGURE 1

RETA
1114

VELOCITY TRAVERSE
AND
TEMPERATURE EQUIPMENT

ASME PTC 27 specifications using stack dimensions measured in the field. Stack temperatures were obtained concurrently with each pitot tube reading by using a thermocouple and a Thermo Electric Mini Mite II potentiometer. The stack moisture content was determined with wet bulb-dry bulb thermometers and psychrometric charts.

Particulate Sampling

Particulate sampling was conducted utilizing the following sampling train: one-quarter inch stainless steel nozzle; RA 360 alundum thimble with stainless steel holder; stainless steel sampling probe; connecting vacuum hose; three Greenberg-Smith dust impingers in series, each filled with demineralized water; a dry gas meter; and a vacuum pump. The typical particulate sampling train utilized is illustrated in Figure 2. The purpose of the alundum thimble and dust impinger combination was for the RA 360 alundum thimble to filter out all particles larger than three microns and for the impingers to trap the remaining fine particulate matter (or fumes). This separation was required so that the results of the particulate measurement could be compared with the standards set forth in Section 3-3.2512 of the "Rules and Regulations."

Where possible all stack samples were taken using isokinetic sampling rates. Due to the very high gas velocity of the dryer stack and the low capacity of the Greenberg-Smith dust impingers, it was not possible to pull gas samples from the dryer at full isokinetic flow rates. It was

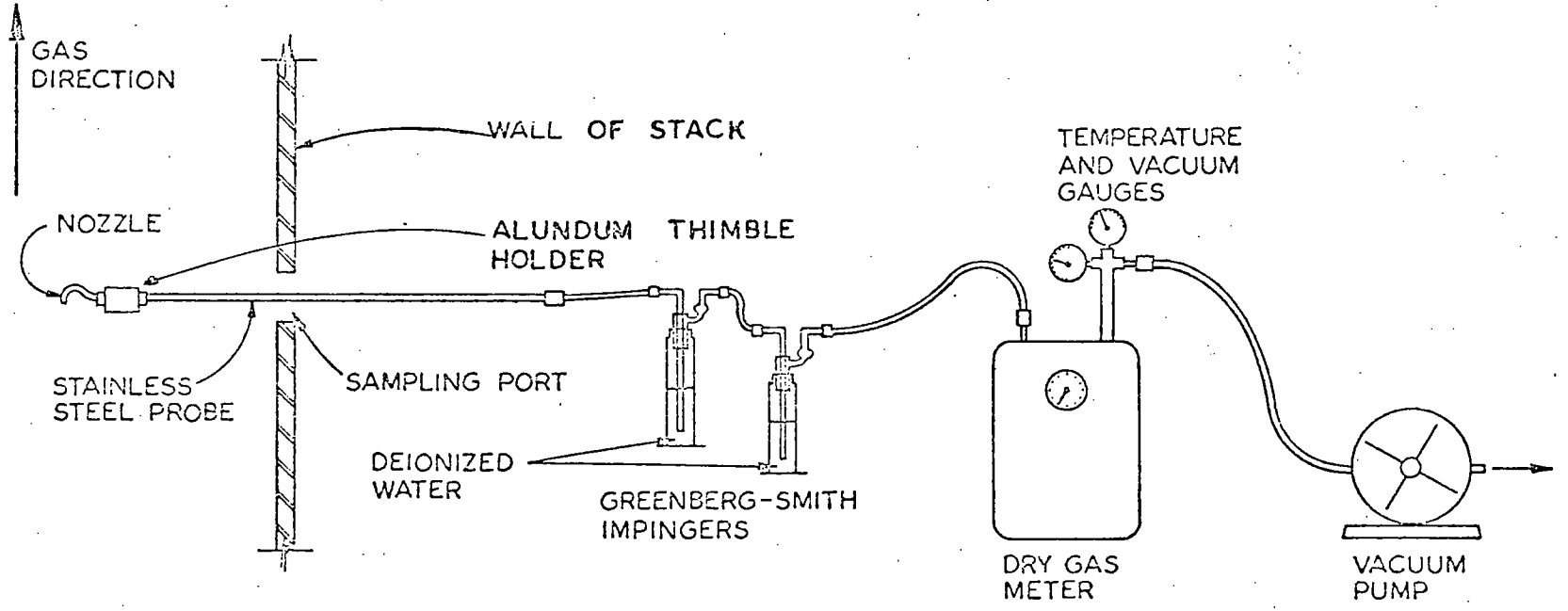


FIGURE 2

RETA

1114

SAMPLING TRAIN
FOR
PARTICULATE SAMPLING

possible, however, to pull the samples from the dryer at approximately 70 to 80 percent of the isokinetic rates. This slight deviation from isokinetic sampling is not considered significant. The objective of isokinetic sampling is to obtain a well graded particulate sample, but the discharge of the dryer after passing through a cyclone and scrubber is already segregated to the lower micron and submicron range.

Particulate Analysis

Particulate loadings from the alundum thimbles and dust impingers were determined by gravimetric techniques. The alundum thimbles were dried and preweighed before being used in the field and then dried and reweighed again after sampling in order to determine the particulate matter collected. The impinged dust samples were removed from the Greenberg-Smith impingers and the demineralized water was evaporated in evaporating dishes. The solid residue remaining was then weighed. This weight is the particulate sample collected.

The particulate sample weights from the alundum thimbles and impingers were converted to dust emissions rates as grains per standard cubic feet and pounds per hour so that the fertilizer dryer and cooler stack emission rates could be compared with the rates set forth by the State of Illinois Pollution Control Board.

RESULTS OF PARTICULATE SAMPLING

A summary of the results of the particulate sampling of the fertilizer dryer and cooler stack is presented in Table 1. The results are expressed in pounds per hour of particulate for total dust emission and fume emissions rate (dust less than 3 microns). The data sheets listing all parameters measured for the individual runs can be found in Appendix 1.

DISCUSSION

The allowable rates of emissions for the fertilizer manufacturing processes as outlined in Section 3-3.2512 of the State of Illinois "Rules and Regulations" are presented below:

Emissions Rate from the dryer shall not exceed:

(1) 0.05 gr/SCF
(2) Standards from Rule 3-3.111
(3) Fume emitted - 4% of Rule 3-3.111

With a discharge volume of 30,550 SCFM and a Total Process Weight Rate of 36 tons per hour these emission rates become:

(1) 13.1 lbs/hr
(2) 41.6 lbs/hr
(3) 1.7 lbs/hr

Thus, an allowable emissions rate of 13.1 lbs/hr with the fume portion not exceeding 1.7 lbs/hr is the controlling criteria for the dryer.

TABLE 1

PARTICULATE SAMPLING RESULTS SUMMARY

DRYER	DISCHARGE	TOTAL EMISSIONS	FUME EMISSION (less than 3 microns)
Run No. 1	30,000 SCFM	8.8 lbs/hr	0.26 lbs/hr
Run No. 2	31,100 SCFM	8.2 lbs/hr	0.27 lbs/hr
AVERAGE	30,550 SCFM	8.5 lbs/hr	0.27 lbs/hr

The average dryer cooler stack discharge was 8.5 lbs/hr with a fume portion of 0.27 lbs/hr. This emissions rate is below the allowable emission rate of 13.1 lbs/hr with a fume portion not to exceed 1.7 lbs/hr.

APPENDIX 1

STACK SAMPLING TEST RESULTS

STACK SAMPLING TEST RESULTS

PROJECT NUMBER

RETA-1114

I. Client: Swift Agricultural Chemicals Corporation
2501 North Kingshighway
Fairmont City, Illinois

II. Process: Fertilizer Dryer and Cooler Stack

III. Test Run No. No. 1 of 2

IV. Date & Time of Run: October 5, 1971 (14:00 - 15:00 hrs)

V. Meteorological Data:

A. Barometric Pressure:	29.7 In. Hg.
B. Relative Humidity:	30% Saturation
C. Ambient Temperature:	80° - 85° F.

VI. Particulate Sampling Data:

A. General Description of Test Section No.	No. 1	
1. Position of stack at Sampling Station	Vertical	
2. General direction of gas flow in stack	Up	
3. Cross sectional area of stack	7.87 sq. ft.	38 in. dia.
4. Number of points in pitot & sampling traverses	6	
B. Dust Sampling Equipment Conditions		
1. Average meter temperature	84	° F.
2. Average meter pressure	9.0	in. Hg. Vac.
3. Volume of gas sampled at meter conditions	62.3	CF
4. Volume of condensate	0	cc.
5. Weight of dust collected	0.092 (0.003 fume)	grams
6. Diameter of sampling nozzle	1/4	in.
7. Actual sampling time 60 min. Outage time:	0	min.
C. Stack Gas Conditions		
1. Average temperature in stack	100	° F.
2. Static pressure in stack	29.7	in. Hg. Abs.
3. Average velocity in stack	67.7	fps.
4. Moisture content of stack gas	5.2 %	
5. Volume of stack gas at stack conditions	31,800	CFM
6. Volume of stack gas at standard conditions	30,000	SCFM
7. Dust concentration at standard conditions	0.034	gr./SCF
8. Dust emission rate	8.8 (total)	lbs./hr.
9. Fume concentration at standard conditions	0.001	gr./SCF.
10. Fume emission rate	0.26	lbs./hr.

STACK SAMPLING TEST RESULTS

PROJECT NUMBER

RETA-1114

I. Client: Swift Agricultural Chemicals Corporation
2501 North Kingshighway
Fairmont City, Illinois

II. Process: Fertilizer Dryer and Cooler Stack

III. Test Run No. No. 2 of 2

IV. Date & Time of Run: October 5, 1971 (15:50 - 16:50 hrs)

V. Meteorological Data:

A. Barometric Pressure:	29.7
B. Relative Humidity:	30% saturation
C. Ambient Temperature:	80° - 85° F.

VI. Particulate Sampling Data:

A. General Description of Test Section No.			No. 1
1. Position of stack at Sampling Station			Vertical
2. General direction of gas flow in stack			Up
3. Cross sectional area of stack	7.87	sq. ft.	38 in. dia.
4. Number of points in pitot & sampling traverses			6
B. Dust Sampling Equipment Conditions			
1. Average meter temperature		89	° F.
2. Average meter pressure		9.0	in. Hg. Vac.
3. Volume of gas sampled at meter conditions		61.6	CF
4. Volume of condensate		0	cc.
5. Weight of dust collected		0.083 (.003 fume)	grams
6. Diameter of sampling nozzle		1/4	in.
7. Actual sampling time 60 min.	Outage time:	0	min.
C. Stack Gas Conditions			
1. Average temperature in stack		95	° F.
2. Static pressure in stack		29.7	in. Hg. Abs.
3. Average velocity in stack		69.5	fps.
4. Moisture content of stack gas		5.2 %	
5. Volume of stack gas at stack conditions		32,800	CFM
6. Volume of stack gas at standard conditions		31,100	SCFM
7. Dust concentration at standard conditions		0.031	gr./SCF
8. Dust emission rate		8.2	lbs./hr.
9. Fume concentration at standard conditions		0.001	gr./SCF
10. Fume emission rate		0.27	lbs./hr.

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF AIR POLLUTION CONTROL
2200 CHURCHILL ROAD
SPRINGFIELD, ILLINOIS 62706

RECEIVED
SEP 30 1971
ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

FOR INFORMATION TELEPHONE 525-7327
(AREA 217)

AMENDED INSTALLATION PERMIT APPLICATION

FOR SOURCE OPERATIONS AND GAS CLEANING DEVICES

Page 1

FOR OFFICE USE ONLY
I. D. Nos. [ ][ ][ ][ ][ ]
Permit No. [ ][ ][ ][ ][ ][ ]
Date Examined [ ][ ][ ][ ][ ][ ] By [ ][ ]

1. Name of Owner: Swift Agricultural Chemicals Corp.
Address of Owner: 111 W. Jackson Blvd. Chicago, Illinois 60604

2. Name and title of person preparing application:
W. H. Biederman, Dir. of Engineering
Signature: W H Biederman

3. Name of Installation: Swift Agricultural Chemicals Corp. Fertilizer Plant
Address of Installation: (street, city, county, zip code)
2501 N. Kingshighway, Fairmont City, Ill.

[X] Inside incorporated limits — City named Fairmont City [ ] Outside limits in Township

0366 00181 7

4. SOURCE OPERATION SCHEDULE (COMPLETE MODIFIED FORM B FOR EACH)

NO. OF UNITS	SOURCE OPERATION	NO. OF UNITS	SOURCE OPERATION	NO. OF UNITS	SOURCE OPERATION	NO. OF UNITS	SOURCE OPERATION
(a)	Spray Booth	(k)	Sandblast	(u)	Dryer	(ae)	Ammoniator-Granulator
(b)	Silk Screen Process	(l)	Rotoblast	(v)	Heat Treating	(af)	
(c)	Flowcoater	(m)	Shot Blast	(w)	Other Oven	(ag)	
(d)	Paint Dip	(n)	Mixers	(x)	Crucible	(ah)	
(e)	Other Dip	(o)	Classification	(y)	Cupola	(ai)	
(f)	Conveyors	(p)	Grinding	(z)	Electric Arc	(aj)	
(g)	Tanks	(q)	Disintegration	(aa)	Induction	(ak)	
(h)	Printing	(r)	Baking Oven	(ab)	Reverberatory	(al)	
(i)	Storage Rooms	(s)	Curing Oven	(ac)	Rotary	(am)	
(j)	Bulk Loading or Unloading	(t)	Kiln	(ad)	Shake Out Areas	(an)	OTHER

5. GAS CLEANING DEVICES SCHEDULE: (COMPLETE PAGE 3 FOR THESE DEVICES)

NO. OF UNITS	CONTROL DEVICE	NO. OF UNITS	CONTROL DEVICE	NO. OF UNITS	CONTROL DEVICE	NO. OF UNITS	CONTROL DEVICE
(a)	Settling Chamber (09)	(e)	Spray Chamber (05)	(i)	Absorber (01)	(m)	Fabric Filter (13)
(b) 2	Cyclone (10)	(f) 1	Scrubber (06)	(j)	Adsorber (02)	(n)	Electrostatic Precipator (14)
(c)	Multiple Cyclone (11)	(g)	Packed Tower (07)	(k)	Catalytic burner (03)	(o)	Masking (15)
(d) 1	Rotoclone (12)	(h)	Venturi Scrubber (08)	(l)	Afterburner (04)	(p)	Other — Specify (16)

6. EQUIPMENT COST

Total Installed Cost Equipment	Cost of Gas Cleaning Equipment	% of Total Equipment Cost
Initial $410,000	Initially $146,000, Adding $6000	37%

Tax Relief Applied For:	Date Applied For:	No. of tax Form:
[ ] Yes [X] No		

SOURCE OPERATIONS DIAGRAM

INSTRUCTIONS:

(a) Flow diagram may be schematic or to scale. All equipment should be shown.

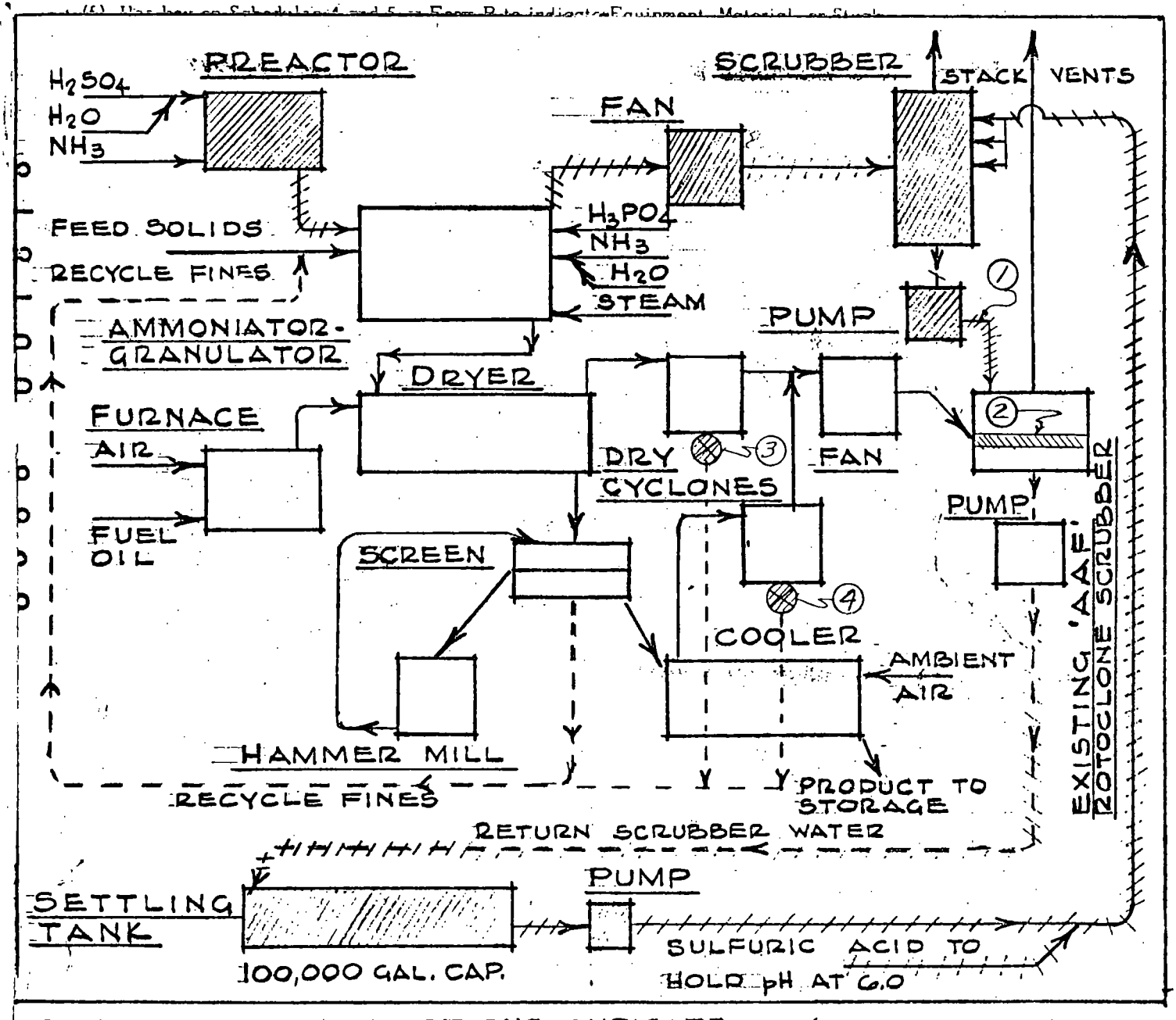
(b) Show complete flow diagram of source operation from raw materials to finished product.

(c) If more than one source operation is being constructed to make finished product, then show each separately and indicate where they merge.

(d) Show number of pieces of equipment doing the same operation.

(e) Indicate all points in process where all or other gases leave the process.

(f) Use key on Schedules 4 and 5 on Form B to indicate Equipment, Material or Stack



CROSS-HATCHED SECTIONS INDICATE ADDITIONS TO EXISTING FACILITIES

(NEW REVISIONS)

① Series Flow Thru Scrubbers

② Mist eliminators in Rotoclone

③ & ④ Rotary Air Lock on Cyclone

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF AIR POLLUTION CONTROL
2200 CHURCHILL ROAD
SPRINGFIELD, ILLINOIS 62706

FOR INFORMATION TELEPHONE 525-7327
(AREA 217)

AMENDED

INSTALLATION PERMIT APPLICATION
FOR SOURCE OPERATIONS AND GAS CLEANING DEVICES

For Ammoniator-Granulator Scrubber

1	a. Complete the sections indicated: [X] 1 [ ] 2 [ ] 3 [ ] 4 [X] 5 [ ] 6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ] 11		b. Installation Address: 2501 N. Kingshighway Fairmont City, Illinois	
	c. Owner Name: Swift Agricultural Chemicals Corp.		d. Owner Address: 111 W. Jackson Blvd. Chicago, Illinois 60604	
	e. Prepared by: (Signature) W. H. Biederman		f. Prepared by: (Name and title) W. H. Biederman, Dir. of Engineering	
2	a. EQUIPMENT DATA	b. Type of Equipment: Wet cyclone scrubber	c. Make and Model: Ceilcote Inc.	d. Dimensions (LxWxH): 5' dia. x 17' high
	e. Number of units, capacity	f. Ceilcote Drawing #D-70319	g. Auxiliary Equipment: 24 veejet nozzles	h. Connected to: Ammoniator-Granulator
3	a. SETTLING CHAMBER	b. Retention time (sec.)	c. Dimensions (LxWxH)	d. Settling Velocity (FPS)
	e. Number of units on construction	f.	g. Length of settling path	h. Connected To:
4	a. BURNER DATA	b. Type of Burner, Fuel	c. Make and Model	d. Rating
	e. Number of units, ignition	f.	g. CFM Exhausted (Temperature)	h. Connected To:
5	a. STACKS, VENTS AND EXHAUST OPENING	b. Type of Vent: Circular FGRP Duct	c. Dimensions (LxWxH): 22" ID x 38' high	d. Dampers: Yes
	e. Number of vents, construction: one (1)	f.	g. CFM Exhausted (Temperature) 60°F [X] o/s [X] i/s 110°F	h. Connected To: Ceilcote scrubber
6	a. LIQUID FLOW	b. Flow (Spray, Bubbler, etc.): 150 gpm thru	c. Contact Area	d. Contact Time (sec.)
	e. Composition of Solution: water @ 6.0 pH	f. 24 veejet nozzles	g. Flow Rate (GPH): 9,000	h. Make Up (GPH): variable to make up evaporation
7	a. FAN DATA	b. Type of Fan (Designate Blade): Plastic Blower	c. Make and Model: BH Series, Size 48	d. Motor Data: 50 HP, 440V, 3 phase
	e. Number of fans, construction: 1 plastic	f. Their drawing #B-BH-2	g. CFM Exhausted (Temp. @ S.P.) 70°F [X] o/s [X] i/s 160°F	h. Connected To: Inlet duct to scrubber
8	a. CYCLONE DATA	b. Type of Cyclone [ ] multiclone [ ] common [ ] split duct	c. Make and Model	d. Inlet Area: Sq. Ft.
	e. Number of units, construction	f. Body Diameter: inch; Outlet Diameter: inch	g. Body Height: Inch; High Efficiency [ ] Yes [ ] No	h. Connected To:
9	a. WASTE DATA	b. Description of waste	c. Amount Collected: Pounds/Day	d. Particle Size (Average): Micron
	e. Types of Pollutants [X] Odor [X] Particulate [ ] Aerosol [X] Gas	f. Scrubber water	g. Collection (specify) [ ] In Bins [ ]	h. Disposition of Collected Waste [ ] Scavenger [ ] (specify)
10	a.	b. from settling pond	c. Settling pond	d. Recycle to
	e.	f. of recycle system	g.	h. process
11	a.	b.	c.	d.
	e.	f.	g.	h.
	i.	j.	k.	l.

03660J1819

ILLINOIS AIR POLLUTION
CONTROL BOARD

cc 80 FORM B – SOURCE OPERATION DATA

SOURCE OPERATION NUMBER 06 cc 79 = CARD IDENTIFICATION – PUNCH: 9 I.D. NO cc 1 – 6

A. DESCRIBE SOURCE OPERATION AND TYPE OF PROCESS EQUIPMENT. New scrubber initially installed to control emissions from the reactor-aglomerator will be operated using all return water from settling pond and then its discharge water flow will be pumped to the scrubber controlling emissions from the dryer-cooler combination.

OFFICE USE ONLY — CARD COLS. 10 11 12 13 — BEC NUMBER — 14 15 16 17 — BEC FACTOR

Card Cols. 7 8 9

B. RAW MATERIALS USED IN SOURCE OPERATION FOR NORMAL THROUGHPUT CAPACITY. NORMAL OPERATION IS 20 TPH % OF MAXIMUM CAPACITY.

For 12-12-12 MATERIAL	STARTING WEIGHT	MATERIAL	STARTING WEIGHT
1. Ammonium Sulfate	18,000 lbs./hr.	5. Anhydrous Ammonia	1600 lbs./hr.
2. Triple Super	4,000 lbs./hr.	6. Sulfuric Acid (60° Be)	1420 lbs./hr.
3. Potassium Chloride	8,000 lbs./hr.	7. Phosphoric Acid	4960 lbs./hr.
4.		8. Filler	2280 lbs./hr.

C. EMISSION: Check types of discharge that can possibly be emitted from process or equipment directly to atmosphere through stacks or ducts.

cc 18 - 1 [X] Solid, particulate matter
cc 19 - 2 [X] Steam
cc 20 - 3 [X] Gases, vapors or fumes
cc 21 - 4 [X] Odors of any type
cc 22 - 5 [X] Mists or Aerosols
cc 23 - 6 [ ] None

SOURCE OPERATION DISCHARGES – cc 24
1 [X] From Stack 2 [ ] At Ground Level 3 [ ] From Vents or other Opening
25 26 27 28: 3 8 (FT.) STACK HEIGHT ABOVE GRADE

D. PROCESS WEIGHT RATE (lbs./hr.) cc 29 30 31 32 33 34 35	E. OPERATION TIME hrs/day cc 36 37 38	F. INLET GAS RATE (SCFM)	G. INLET LOADING GRAINS/SCF	H. INLET LOADING lbs/1000 lbs GAS	I. PRIMARY COLLECTOR (See Code Below)	J. SECONDARY COLLECTOR (See Code Below)	K. (%) Card Cols.
			Card Cols. 39 40 41 42	Card Cols. 58 59 60 61	Card Cols. 43 44	Card Cols. 62 63	Card Cols. 45 46 47 / 64 65 66
7 2 0 0 0	1 6	6,000		To Ceilcote Scrubber: 0.43	0 6	0 5	9 0 / 9 0

L. OPERATION IS [ ] Continuous [ ] Batch Cycle per batch (hrs.). . . . . CD. COLS. 48 49 50

CARD COLS 51 52 53 54 55 56 57

M. MEASURED – ESTIMATED – EMISSIONS TO ATMOSPHERE (lbs/hr) 67 68 69 70 71: 2.0

N. ALLOWABLE EMISSIONS TO ATMOSPHERE (lbs/hr.) 72 73 74 75 76: 2.1

INSTRUCTIONS: (NOTE – Dotted lines indicate position of decimal point. Use additional sheets for miscellaneous comments.)

Item A. Describe your source operation and type of process equipment.
B. List all starting raw materials charged, including solid fuels. Specify lbs/hr. For batch operations specify lbs.
C. Check appropriate boxes and enter discharge information.
D. Indicate the total weight rate of all materials introduced into the source operation. Solid fuels charged will be considered as part of the process weight but liquid and gaseous fuels and combustion air will not. Include recycled material.
E. Enter normal operational hours per day for this source operation.
F. Enter rate of gas inlet to collection equipment in standard cubic feet per minute.
G&H. Enter particulate concentration of gas inlet to collection equipment in either column G or H.
I&J. List collection equipment serving the process, code as follows:

01–Absorber 02–Adsorber 03–Catalytic burner 04–Afterburner 05–Spray Chamber 06–Scrubber 07–Packed Tower 08–Venturi Scrubber 09–Settling Chamber 10–Cyclone 11–Multiclone 12–Rotoclone 13–Baghouse 14–Precipitator 15–Masking 16–Other

K. Enter estimate of collector efficiency (%).
L. Check type of operation. For batch operation, enter hours per batch cycle.
M. Enter estimate of particulates emitted to the atmosphere from this operation in lbs/hr. Circle Measured or Estimated.
N. Enter allowable emission from Table I, Chapter III of the Regulations.

August 31, 1971

SWIFT AGRICULTURAL CHEMICALS CORP.
FERTILIZER PLANT - FAIRMONT CITY, ILLINOIS

Description of Source Operation and Type of Process Equipment with Amended Installation.

The manufacture of granulator chemical fertilizers comprises a mixing together of various milled dry ingredients into a base blend which are then subsequently combined with liquids to form an agglomerating mixture within a rotary drum. The latter is called an ammoniator-granulator which in this plant will operate on a continuous basis. At this stage of manufacture, the various ingredients react chemically to form ammonium phosphates and ammonium sulfate by the combination of liquid anhydrous ammonia with the superphosphates in the dry ingredient blend and the added liquid phosphoric acid and/or sulfuric acid. Considerable heat is derived from the foregoing exothermic reactions to increase the temperature of the mixture within the ammoniator-granulator so that a substantial portion of the moisture present in the solids, the acid or that added as such will evolve as steam. Under these conditions the rolling mass within the rotary drum attains a plasticity which induces the finely divided solids to agglomerate into a range of larger sized particles. Hence, the designation for this process device as the ammoniator-granulator. The excess steam from the ammoniator-granulator is drawn off through a duct and fan which induces sufficient air flow to adequately ventilate the process at this stage. The combination of air and steam vapors will also carry some ammonia vapor as the adsorption and chemical reaction within the ammoniator-granulator is not 100% effective. The minimum efficiency should never be lower than 95% and usually runs substantially better, i.e. 97-98%.

It is estimated that the proposed wet scrubber which will wash this combination air-steam-ammonia with recycled water at a controlled pH of 6.0 to 7.0 will have an absorption efficiency of greater than 92%.

As a further improvement in the ammoniator-granulator operation, the system will include a pre-reactor to provide a preliminary neutralization of the sulfuric acid so that it will be unreactive with the potassium chloride (KCl) dry ingredient portion of the base blends. Prior operation of ammoniator-granulators has been carried out adding strong sulfuric acid directly to the base blend and resultant interaction of the H_2SO_4 and KCl to evolve some HCl vapors which in turn combined with NH_3 vapor to form an aerosal of ammonium chloride (NH_4Cl). The granulator system at Fairmont City will not be plagued with generation of a haze due to NH_4Cl formation, a difficult material to scrub out.

It should be emphasized that phosphoric acid is not reactive with KCl at the temperatures involved in the process, i.e. 180-250°F. It can therefore be added directly to the ammoniator-granulator.

Following the ammoniation-granulation step, the product is dried in a rotary tube dryer heated with a co-current flow of hot air direct from a fuel oil fired furnace. The air withdrawn from the dryer is pulled through an existing duct and dry cyclone, into an existing fan and then through an existing wet scrubber (AAF Rotoclone).

In this amended installation permit request we are altering the dust removal means at the bottom of the cyclone cones from vacuum actuated flap gates to rotary air locks. These are items 3 and 4 in the attached flow diagram. We are also installing mist eliminator blades within the lower section of the Rotoclone to substantially reduce loss of droplets through the exit stack. This is new revision item 2.

Dry granular product leaving the dryer is subsequently screened to remove over-size and fines for recycle and on-size product is showered in a rotary tube cooler in a counter current flow of ambient air. The latter is withdrawn through an existing duct and dry cyclone after which it combines with the dryer cyclone discharge to enter the common fan and forced through the same wet scrubber which cleans the dryer air.

In order to obtain effective air cleaning in both the Ceilcote Co., Inc. wet scrubber for the ammoniator-granulator and the AAF Rotoclone wet scrubber, adequate amounts of clear supernatant overflow will be withdrawn from a 100,000 gallon capacity settling tank where in excess of 8 hours hold-up will be provided. This recycle water will have a controlled quantity of sulfuric acid added so the pH is held at 6.0. Material accumulating in the settling tank will be withdrawn at regular intervals to be used in formulation of granular chemical fertilizers. No overflow will occur from the settling tank to the plant drainage system or outfall sewers. Sufficient make-up water will be added to compensate for the evaporation occurring in the scrubbers.

Instead of providing parallel flow of settled pond water to the two scrubbers, we are altering the piping to provide series flow. This will be accomplished by installing item 1 of new revisions and eliminating previous drain line for the ammoniator-granulator scrubber. Likewise, the supply line to the dryer-cooler scrubber will be eliminated by disconnecting its connection with the Rotoclone spray manifold.

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF AIR POLLUTION CONTROL
2200 CHURCHILL ROAD
SPRINGFIELD, ILLINOIS 62706

RECEIVED
SEP 30 1971

FOR INFORMATION TELEPHONE 525-7327
(AREA 217)

ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

AMENDED INSTALLATION PERMIT APPLICATION FOR SOURCE OPERATIONS AND GAS CLEANING DEVICES

For Dryer Cooler Scrubber & Cyclones

Page 3

1	a. Complete the sections indicated: ☒1 ☒2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10 ☐11		b. Installation Address: 2501 N. Kingshighway Fairmont City, Illinois	
	c. Owner Name: Swift Agricultural Chemicals Corp.		d. Owner Address: 111 W. Jackson Blvd. Chicago, Illinois 60604	
	e. Prepared by: (Signature) W. H. Biederman		f. Prepared by: (Name and title) W. H. Biederman, Director of Engineering	
2	a. EQUIPMENT DATA	b. Type of Equipment Rotoclone	c. Make and Model Type R	d. Dimensions (LxWxH) 7'x 4'-6" x 16'
	e. Number of units, capacity 1 - 38,500 (max.)	f.	g. Auxiliary Equipment 7 cones	h. Connected to: cyclone exhaust duct
3	a. SETTLING CHAMBER	b. Retention time (sec.)	c. Dimensions (LxWxH)	d. Settling Velocity (FPS)
	e. Number of units on construction	f.	g. Length of settling path	h. Connected To:
4	a. BURNER DATA	b. Type of Burner, Fuel	c. Make and Model	d. Rating
	e. Number of units, ignition	f.	g. CFM Exhausted (Temperature)	h. Connected To:
5	a. STACKS, VENTS AND EXHAUST OPENING	b. Type of Vent circular steel stack rubber l.	c. Dimensions (LxWxH) 38" ID x 48' high	d. Dampers on cyclone outlets
	e. Number of vents, construction	f.	g. CFM Exhausted (Temperature) 60°F ☒o/s ☒i/s 110°F	h. Connected To:
6	a. LIQUID FLOW	b. Flow (Spray, Bubbler, etc.) 150-180 gpm	c. Contact Area	d. Contact Time (sec.)
	e. Composition of Solution water at 6.0 pH	f. 7 clones	g. Flow Rate (GPH) 9000 - 10,800	h. Make Up (GPH) variable to equal evaporation
7	a. FAN DATA	b. Type of Fan (Designate Blade) Flat blade	c. Make and Model Buffalo MW 90	d. Motor Data 150 HP - 1750 RPM
	e. Number of fans, construction 1 - steel	f.	g. CFM Exhausted (Temp. & S.P.) 70°F ☒o/s ☒i/s 150°F	h. Connected To: duct between cyclones & scrubber
8	a. CYCLONE DATA	b. Type of Cyclone ☐multiclone ☒common ☐split duct	c. Make and Model A.J. Sackett & Sons	d. Inlet Area 5 Sq. Ft.
	e. Number of units, construction 2 - steel	f. Body Diameter 7'-9" inch / Outlet Diameter 32" inch	g. Body Height 60" Inch / High Efficiency ☐Yes ☒No	h. Connected To: See data below on cooler cyclone DRYER
9	a. WASTE DATA	b. Description of waste	c. Amount Collected Pounds/Day	d. Particle Size (Average) Microns
	e. Types of Pollutants ☐Odor ☐Particulate ☐Aerosol ☐Gas	f.	g. Collection (specify) ☐In Bins ☐	h. Disposition of Collected Wastes ☐Scavenger ☐(specify)
10	a. Water drains from the dryer-cooler scrubber by gravity to a large settling tank	b.	c.	d.
	e. (100,000 gal. capacity) from which clarified supernatant is returned to the	f.	g.	h.
11	a. Ammoniator-Granulator scrubber and its	b.	c. drainage is then pumped to the dryer-	d.
	e. cooler scrubber.	f. The recirculation rate is in range of 150-180 gpm.	g.	h.
	i.	j.	k.	l.

Cooler cyclone has a 6'-6" body diameter; 36" outlet diameter, is not high efficiency and is connected to the cooler.

ILLINOIS . POLLUTION CONTROL BOARD

cc 80 FORM B – SOURCE OPERATION DATA

SOURCE OPERATION NUMBER 12 cc 79 = CARD IDENTIFICATION – PUNCH: 9 I.D. NO cc 1 – 6

A. DESCRIBE SOURCE OPERATION AND TYPE OF PROCESS EQUIPMENT. Existing Rotoclone scrubs air leaving dryer-cooler cyclones and it will have installed in lower section a series of Heil mist eliminator blades to reduce substantially the amount of droplets escaping from the Rotoclone.

Card Cols. 7 8 9

OFFICE USE ONLY — CARD COLS. 10 11 12 13

BEC NUMBER — 14 15 16 17

BEC FACTOR

B. RAW MATERIALS USED IN SOURCE OPERATION FOR NORMAL THROUGHPUT CAPACITY. NORMAL OPERATION IS 2 0 TPH % OF MAXIMUM CAPACITY. 100

For 12-12-12

MATERIAL	STARTING WEIGHT	MATERIAL	STARTING WEIGHT
1. Ammonium Sulfate	18,000 Lbs./Hr.	5. Anhydrous Ammonia	1600 Lbs./Hr.
2. Triple Super	4,000 Lbs./Hr.	6. Sulfuric Acid (60° Be)	1420 Lbs./Hr.
3. Potassium Chloride	8,000 Lbs./Hr.	7. Phosphoric Acid	4960 Lbs./Hr.
4.		8. Filler	2280 Lbs./Hr.

C. EMISSION: Check types of discharge that can possibly be emitted from process or equipment directly to atmosphere through stacks or ducts.

cc 18 - 1 [X] Solid, particulate matter
cc 19 - 2 [ ] Steam
cc 20 - 3 [X] Gases, vapors or fumes
cc 21 - 4 [ ] Odors of any type
cc 22 - 5 [X] Mists or Aerosols
cc 23 - 6 [ ] None

SOURCE OPERATION DISCHARGES – cc 24
1 [X] From Stack 2 [ ] At Ground Level 3 [ ] From Vents or other Opening

cc 25 26 27 28: 4 8 (FT.) STACK HEIGHT ABOVE GRADE

D. PROCESS WEIGHT RATE (lbs./hr.) cc 29 30 31 32 33 34 35: 7 2 0 0 0

E. OPERATION TIME hrs/day cc 36 37 38: 1 6

L. OPERATION IS
[X] Continuous
[ ] Batch Cycle per batch (hrs.).....

CD. COLS. 48 49 50

CARD COLS 51 52 53 54 55 56 57

COLLECTION EQUIPMENT

F. INLET GAS RATE (SCFM): 30,000

G. INLET LOADING GRAINS/SCF ... To dryer-cooler dry cyclones ... cc 39 40 41 42: 9 3 3

H. lbs/1000 lbs GAS ..... 0, cc 58 59 60 61: 0 0 1 7

I. PRIMARY COLLECTOR: cc 43 44: 1 0 (See Code Below)

J. SECONDARY COLLECTOR: cc 62 63: 1 2 (See Code Below)

K. (%) Card Cols. 45 46 47: 9 0 — 64 65 66: 9 4

M. MEASURED – ESTIMATED – EMISSIONS TO ATMOSPHERE (lbs/hr) ..... cc 67 68 69 70 71: 1 4 4 0

N. ALLOWABLE EMISSIONS TO ATMOSPHERE (lbs/hr.) ..... cc 72 73 74 75 76: 1 4.5 1

INSTRUCTIONS: (NOTE – Dotted lines indicate position of decimal point. Use additional sheets for miscellaneous comments.)

Item A. Describe your source operation and type of process equipment.
B. List all starting raw materials charged, including solid fuels. Specify lbs/hr. For batch operations specify lbs.
C. Check appropriate boxes and enter discharge information.
D. Indicate the total weight rate of all materials introduced into the source operation. Solid fuels charged will be considered as part of the process weight but liquid and gaseous fuels and combustion air will not. Include recycled material.
E. Enter normal operational hours per day for this source operation.
F. Enter rate of gas inlet to collection equipment in standard cubic feet per minute.
G&H. Enter particulate concentration of gas inlet to collection equipment in either column G or H.
I&J. List collection equipment serving the process, code as follows:

01–Absorber 02–Adsorber 03–Catalytic burner 04–Afterburner 05–Spray Chamber 06–Scrubber 07–Packed Tower 08–Venturi Scrubber 09–Settling Chamber 10–Cyclone 11–Multiclone 12–Rotoclone 13–Baghouse 14–Precipitator 15–Masking 16–Other

K. Enter estimate of collector efficiency (%).
L. Check type of operation. For batch operation, enter hours per batch cycle.
M. Enter estimate of particulates emitted to the atmosphere from this operation in lbs/hr. Circle Measured or Estimated.
N. Enter allowable emission from Table I, Chapter III of the Regulations.